

99-188

1935

DEPARTMENT OF COMMERCE
Bureau of Fisheries
WASHINGTON

Mem. S-338

HOME CANNING OF FISH

(By Norman D. Jarvis, Asst. Technologist, and Francis P. Griffiths, Jr.
Bacteriologist, U. S. Bureau of Fisheries.)

General Directions:

The home canning of fish shculd be considered only when a supply of suitable raw material may be obtained at low cost. Where fish is purchased for canning at average wholesale prices, the cost of the home canned fish is much higher than that of the commercially canned product. Only fresh fish should be canned and these should be bled and thoroughly cleaned of all viscera and membranes when caught or as soon thereafter as practicable. Do not attempt to "save" a lot of fish from spoilage some time after catching by canning, as the finished product will be of inferior quality. Canning should be restricted to proven varieties where it is definitely known that a product of good quality may be obtained.

IN THE HOME CANNING OF FISHERY PRODUCTS ONLY A RELIABLE STEAM PRESSURE COOKER SHOULD BE USED FOR COOKING THE PRODUCT IN THE CONTAINERS. The hot water bath or oven "processing" (sterilization) methods are not safe and, therefore, can not be recommended. It is recommended that the steam pressure cooker be equipped with an "industrial" type thermometer as well as a pressure gauge. This is needed as a check on the accuracy of the pressure gauge, and as a means of determining errors which may occur in the operation of the pressure cooker.

NO CONTAINER LARGER THAN A PINT JAR OR NUMBER 2 TIN CAN SHOULD BE USED IN THE HOME CANNING OF FISH. Difficulties in sterilization make the use of larger sized containers unsafe. A "plain" (unenameled) can may be used for salmon or shad, but in canning shellfish or shrimp a can lined with "C" enamel should be used to prevent discoloration.

When using No. 2 cans a cooking period of not less than 90 minutes at 10 pounds of pressure (240° F.) should be given for safe sterilization. For pint jars, the recommended cook is 100 minutes at 10 pounds of pressure (240° F.). Exceptions in the case of special products will be noted in the directions for packing that product.

In precessing (sterilizing) in the pressure cooker, do not close the vent (petcock) until the steam is escaping in a steady stream with a hissing noise. At lease seven minutes should be allowed from the time the vapor first escapes before closing the vent.

All containers should be inspected before canning, and only containers without defects should be used. Containers and contents should be examined before consumption of the product and if defects are noted or any product is of doubtful quality, it should be discarded.

Recommended Procedures

The methods given herein are recommended only for the fish specifically named. However, the processes as given are adequate for the sterilization of practically all varieties of fishery products. Because of certain peculiar physical properties of some species of fish, certain of the processes might not produce an attractive product, or in some cases, the temperature or processing time would be so severe that quality would be affected. Therefore, if it is desired to can a fish not listed here it is suggested that the home canner experiment with more than one method selecting the one giving the best results. As an example, the first method would probably be best for firm fleshed fish resembling salmon or shad, while fish of rather soft texture, such as freshwater fish, might be better adapted to the method used for mackerel.

The home canner should remember that this publication is intended only as a guide, not an infallible recipe, and that much depends on the care with which instructions are followed.

Salmon and Shad.

1. Clean and wash the fish thoroughly, scraping off scales and slime, and removing all traces of blood or other waste material. The backbone should not be cut away. It contains valuable minerals and is made quite soft and edible by cooking in the pressure cooker.

2. Cut the cleaned fish in can-length pieces, then soak in a salt brine for sixty minutes. The brine is made by dissolving one-half pound of salt in a gallon of water. Do not use it more than once.

3. Drain the brined fish for several minutes, then fill into the containers. Pack the containers solidly until the fish is even with the rim. Do not crush or jam the fish into the container when packing.

4. (a) If pint jars are used, seal loosely and process in the pressure cooker for 100 minutes (1 hour and 40 minutes) at 10 pounds of pressure (240° F.).

(b) If the fish is packed in No. 2 cans, put on the lids loosely and steam in the cooker for fifteen minutes at 212° F., without fastening down the cover. Then remove the cans and seal immediately. Process for 90 minutes at 10 pounds of pressure (240° F.).

5. (a) Tighten the seals of the pint jars and cool in the air, taking care not to stack the jars closely together as this will delay cooling.

(b) Cool the No. 2 cans in running water. If this cannot be done, put them in a tub of water, changing the water as it becomes warm.

Twenty-five pounds of fish, round weight, will be required to fill a dozen No. 2 cans or pint jars.

Mackerel, Lake Trout, Whitefish, and Mullet or "Mooneye"

1. Use only fresh fish. Clean the fish thoroughly, cutting away strips of the thin belly section between half and three-fourths of an inch in width. Wash the cleaned fish well in fresh water then drain for a few minutes.
2. Split the cleaned and washed fish, but do not attempt to cut out the backbone. Then cut the split fish in container length pieces and soak these in brine for sixty minutes. The brine is made by adding one-half pound of salt to one gallon of water.
3. Drain the brined fish, then fill into the containers, alternating head and tail ends in order to secure a good fill. If pint jars are used, the skin side of the fish should face the glass. Pack the fish in the containers even with the rim.
4. (a). If pint jars are used, submerge the open jars in a kettle containing brine made in the proportion of 4 ounces of salt to a gallon of water. Bring this brine to a boil and allow to boil for fifteen minutes.
(b) If the pack is made in No. 2 cans, they are submerged in boiling brine of the same strength and boiled for 15 minutes.
5. Remove the containers, whether cans or jars, and invert them on a wire screen to drain for about three minutes. The drained liquid is discarded. Add a bay leaf or two and a couple of slices of onion to each container. Seal immediately while hot.
6. (a) If packed in pint jars, process for 100 minutes at 10 pounds of pressure (240° F.). Release pressure very slowly from the pressure cooker, (allowing 15 to 20 minutes) and remove the jars.
(b) If the pack is made in tin, process it for 90 minutes at 10 pounds of pressure (240° F.).
7. (a) Tighten the seals of the jars and air cool.
(b) Cool the cans in water.

Twenty-six and one-half pounds of fish, round weight, will be required to fill a dozen No. 2 cans or pint jars.

Mackerel in Tomato Sauce

Follow the method given above to, but not including, step No. 5, then proceed as follows:

5. Remove the containers and invert on a screen to drain for about three minutes, discarding the drained liquid.
6. (a) Fill pint jars with hot tomato sauce to within 1/2 inch of the rim. Seal immediately. Process for 100 minutes at 10 pounds of pressure (240° F.), releasing pressure slowly as instructed above.

6. (b) Fill No. 2 cans with hot tomato sauce. Seal immediately. Process for 90 minutes at 10 pounds of pressure.

Recipe for Tomato Sauce

1 gallon tomato puree	1/2 oz. ground horseradish
6 tablespoons spiced vinegar,	2 tablespoons minced onion,
1 oz. salt	

Mix the ingredients and concentrate by boiling to one-half the original volume.

Twenty-six and one-half pounds of fish, round weight, will be required to fill a dozen No. 2 cans or pint jars.

~~Spiced Fish~~ Spiced Fish

Salmon, shad, mackerel, trout, or lake trout, may be used.

1. Scrape off all scales and slime. Clean and wash thoroughly, removing all waste material. Split the fish in sides, but do not take out the backbone.

2. Cut the cleaned fish into can length pieces, then soak in a salt brine for 60 minutes. The brine is made by dissolving one-half pound of salt in a gallon of water.

3. Fill into containers to a weight averaging 20 ounces, packed rather loosely. Fill up each one with vinegar sauce, diluted one-half.

(a) Put cans in boiling water at a level of about two inches below the rims of the cans and allow to boil for twenty minutes.

(b). If pint jars are used, put them in cold water at the same level. Bring the water to a boil and cook for twenty minutes.

4. Invert the containers on a wire screen and drain for about three minutes. Add several slices of raw onion, a bay leaf, a few mixed spices, 1/4 teaspoon of salt, and enough strong spiced vinegar to cover the fish. A tablespoonful of olive oil may be added, if desired.

5. (a) Seal pint jars rather loosely and process for 90 minutes at 10 pounds of pressure (240° F.). Release pressure very gradually after sterilization.

(b) Clinch lids of No. 2 cans rather loosely and steam for ten minutes at 212° F. Seal the cans immediately and process for 80 minutes at 10 pounds of pressure (240° F.).

6. (a) Tighten seals of pint jars and air cool.

(b) Cool cans in water immediately after processing.

Spiced Vinegar Sauce

2 quarts vinegar (preferably distilled),	1/4 oz. whole cloves,
1 quart water,	1/8 oz. cracked cardamon seed,
2 oz. sugar,	1/8 oz. cracked whole ginger,
1/4 oz. whole white pepper,	1/8 oz. bay leaves,
1/4 oz. mustard seed.	

Add the sugar and water to the vinegar. Put in the spices, tied in a cloth and allow the mixture to simmer, but not boil, for one hour. After straining use the clear liquor.

Twenty-seven to thirty pounds of fish, round weight, will be required to fill a dozen No. 2 cans or pint jars.

Fish Chowder

Flesh from backbones and heads or other portions of fish may be utilized. The amounts in the formula given here are sufficient for one dozen No. 2 cans or pint jars.

5 lbs. diced potato,	2 qts. fish broth,
5 lbs. fish, boned, (edible portion)	2 Tbsp. salt,
3/4 lb. salt pork, fat back, diced,	1/2 Tsp. pepper.
3/4 lb. chopped onion,	

1. Dice the pork in quarter inch cubes, chop the onion quite finely, then dice the potato in half inch cubes.

2. Braise the diced pork in the bottom of a two gallon kettle until it is yellow in color. Then add the onions and cook them until they are soft and light yellow in color.

3. Add the potatoes, fish, and fish broth. Heat to boiling. Add the salt and pepper, stirring well.

4. Fill into containers and seal immediately while hot.

5. (a) Process (sterilize) pint jars 100 minutes at 10 pounds of pressure or (240° F.).

(b) Process (sterilize) No. 2 cans 90 minutes at 10 pounds of pressure or (240° F.).

6. (a) Tighten seals of pint jars after canning and air cool.

(b) Cool No. 2 cans as rapidly as possible after canning in cold or running water.

7. This is a condensed chowder. To prepare it for the meal, add 1 pint of milk and a tablespoon of cornstarch (if desired as a thickener), to the contents of a No. 2 can or pint jar and heat before serving.

15
426
131DEPARTMENT OF COMMERCE
Bureau of Fisheries
Washington

Mem. S-338.

HOME CANNING OF FISH

by

63

Norman D. Jarvis, Assistant Technologist,
Francis P. Griffiths, Junior Bacteriologist,
U. S. Bureau of Fisheries.

General Directions:

The home canning of fish should be considered only when a supply of suitable raw material may be obtained at low cost. Where fish is purchased for canning at average wholesale prices, the cost of the home canned fish is much higher than that of the commercially canned product. Only fresh fish should be canned and these should be bled and thoroughly cleaned of all viscera and membranes when caught or as soon thereafter as practicable. Do not attempt to "save" a lot of fish from spoilage some time after catching by canning, as the finished product will be of inferior quality. Canning should be restricted to proven varieties where it is definitely known that a product of good quality may be obtained.

IN THE HOME CANNING OF FISHERY PRODUCTS ONLY A RELIABLE STEAM PRESSURE COOKER SHOULD BE USED FOR COOKING THE PRODUCT IN THE CONTAINERS. The hot water bath or oven "processing" (sterilization) methods are not safe and, therefore, cannot be recommended. It is recommended that the steam pressure cooker be equipped with an "industrial" type thermometer as well as a pressure gauge. This is needed as a check on the accuracy of the pressure gauge, and as a means of determining errors which may occur in the operation of the pressure cooker.

NO CONTAINER LARGER THAN A PINT JAR OR NUMBER 2 TIN CAN SHOULD BE USED IN THE HOME CANNING OF FISH. Difficulties in sterilization make the use of larger sized containers unsafe. A "plain" (unenameled) can may be used for salmon or shad, but in canning shellfish or shrimp a can lined with "C" enamel should be used to prevent discoloration.

When using No. 2 cans a cooking period of not less than 90 minutes at 10 pounds of pressure (240° F.) should be given for safe sterilization. For pint jars, the recommended cook is 100 minutes at 10 pounds of pressure (240° F.). Exceptions in the case of special products will be noted in the directions for packing that product.

In processing (sterilizing) in the pressure cooker, do not close the vent (petcock) until the steam is escaping in a steady stream with a hissing noise. At least seven minutes should be allowed from the time the vapor first escapes before closing the vent.

All containers should be inspected before canning, and only containers without defects should be used. Containers and contents should be examined before consumption of the product and if defects are noted or any product is of doubtful quality, it should be discarded.

36

Recommended Procedures

The methods given herein are recommended only for the fish specifically named. However, the processes as given are adequate for the sterilization of practically all varieties of fishery products. Because of certain peculiar physical properties of some species of fish, certain of the processes might not produce an attractive product, or in some cases, the temperature or processing time would be so severe that quality would be affected. Therefore, if it is desired to can a fish not listed here it is suggested that the home canner experiment with more than one method selecting the one giving the best results. As an example, the first method would probably be best for firm fleshed fish resembling salmon or shad, while fish of rather soft texture, such as fresh-water fish, might be better adapted to the method used for mackerel.

The home canner should remember that this publication is intended only as a guide, not an infallible recipe, and that much depends on the care with which instructions are followed.

Salmon and Shad.

1. Clean and wash the fish thoroughly, scraping off scales and slime, and removing all traces of blood or other waste material. The backbone should not be cut away. It contains valuable minerals and is made quite soft and edible by cooking in the pressure cooker.
 2. Cut the cleaned fish in can-length pieces, then soak in a salt brine for sixty minutes. The brine is made by dissolving one-half pound of salt in a gallon of water. Do not use it more than once.
 3. Drain the brined fish for several minutes, then fill into the containers. Pack the containers solidly until the fish is even with the rim. Do not crush or jam the fish into the container when packing.
 4. (a). If pint jars are used, seal loosely and process in the pressure cooker for 100 minutes (1 hour and 40 minutes) at 10 pounds of pressure (240° F.).
(b). If the fish is packed in No. 2 cans, put on the lids loosely and steam in the cooker for fifteen minutes at 212° F., without fastening down the cover. Then remove the cans and seal immediately. Process for 90 minutes at 10 pounds of pressure (240° F.).
 5. (a). Tighten the seals of the pint jars and cool in the air, taking care not to stack the jars closely together as this will delay cooling.
(b). Cool the No. 2 cans in running water. If this cannot be done, put them in a tub of water, changing the water as it becomes warm.
- Twenty-five pounds of fish, round weight, will be required to fill a dozen No. 2 cans or pint jars.

Mackerel, Lake Trout, Whitefish, and Mullet or "Mooneye"

1. Use only fresh fish. Clean the fish thoroughly, cutting away strips of the thin belly section between half and three-fourths of an inch in width. Wash the cleaned fish well in fresh water then drain for a few minutes.
2. Split the cleaned and washed fish, but do not attempt to cut out the backbone. Then cut the split fish in container length pieces and soak these in brine for sixty minutes. The brine is made by adding one-half pound of salt to one gallon of water.
3. Drain the brined fish, then fill into the containers, alternating head and tail ends in order to secure a good fill. If pint jars are used, the skin side of the fish should face the glass. Pack the fish in the containers even with the rim.
4. (a). If pint jars are used, submerge the open jars in a kettle containing brine made in the proportion of 4 ounces of salt to a gallon of water. Bring this brine to a boil and allow to boil for fifteen minutes.
(b). If the pack is made in No. 2 cans, they are submerged in boiling brine of the same strength and boiled for 15 minutes.
5. Remove the containers, whether cans or jars, and invert them on a wire screen to drain for about three minutes. The drained liquid is discarded. Add a bay leaf or two and a couple of slices of onion to each container. Seal immediately while hot.
6. (a). If packed in pint jars, process for 100 minutes at 10 pounds of pressure (240° F.). Release pressure very slowly from the pressure cooker, (allowing 15 to 20 minutes) and remove the jars.
(b). If the pack is made in tin, process it for 90 minutes at 10 pounds of pressure (240° F.).
7. (a). Tighten the seals of the jars and air cool.
(b). Cool the cans in water.

Twenty-six and one-half pounds of fish, round weight, will be required to fill a dozen No. 2 cans or pint jars.

Mackerel in Tomato Sauce

Follow the method given above to, but not including, step No. 5, then proceed as follows:

5. Remove the containers and invert on a screen to drain for about three minutes, discarding the drained liquid.
6. (a). Fill pint jars with hot tomato sauce to within $\frac{1}{2}$ inch of the

rim. Seal immediately. Process for 100 minutes at 10 pounds of pressure (240° F.), releasing pressure slowly as instructed above.

(b). Fill No. 2 cans with hot tomato sauce. Seal immediately. Process for 90 minutes at 10 pounds of pressure.

Recipe for Tomato Sauce

1 gallon tomato puree,	$\frac{1}{2}$ oz. ground horseradish,
6 tablespoons spiced vinegar,	2 tablespoons minced onion,
1 oz. salt.	

Mix the ingredients and concentrate by boiling to one-half the original volume.

Twenty-six and one-half pounds of fish, round weight, will be required to fill a dozen No. 2 cans or pint jars.

Spiced Fish

Salmon, shad, mackerel, trout, or lake trout, may be used.

1. Scrape off all scales and slime. Clean and wash thoroughly, removing all waste material. Split the fish in sides, but do not take out the backbone.

2. Cut the cleaned fish into can length pieces, then soak in a salt brine for 60 minutes. The brine is made by dissolving one-half pound of salt in a gallon of water.

3. Fill into containers to a weight averaging 20 ounces, packed rather loosely. Fill up each one with vinegar sauce, diluted one-half.

(a). Put cans in boiling water at a level of about two inches below the rims of the cans and allow to boil for twenty minutes.

(b). If pint jars are used, put them in cold water at the same level. Bring the water to a boil and cook for twenty minutes.

4. Invert the containers on a wire screen and drain for about three minutes. Add several slices of raw onion, a bay leaf, a few mixed spices, $\frac{1}{2}$ teaspoon of salt, and enough strong spiced vinegar to cover the fish. A tablespoonful of olive oil may be added, if desired.

5. (a). Seal pint jars rather loosely and process for 90 minutes at 10 pounds of pressure (240° F.). Release pressure very gradually after sterilization.

(b). Clinch lids of No. 2 cans rather loosely and steam for ten minutes at 212° F. Seal the cans immediately and process for 80 minutes at 10 pounds of pressure (240° F.).

6. (a). Tighten seals of pint jars and air cool.
- (b). Cool cans in water immediately after processing.

Spiced Vinegar Sauce

2 quarts vinegar (preferably distilled),	$\frac{1}{4}$ oz. whole cloves,
1 quart water,	1/8 oz. cracked cardamom seed,
2 oz. sugar,	1/8 oz. cracked whole ginger,
$\frac{1}{2}$ oz. whole white pepper,	1/8 oz. bay leaves,
$\frac{1}{2}$ oz. mustard seed.	

Add the sugar and water to the vinegar. Put in the spices, tied in a cloth and allow the mixture to simmer, but not boil, for one hour. After straining use the clear liquor.

Twenty-seven to thirty pounds of fish, round weight, will be required to fill a dozen No. 2 cans or pint jars.

Fish Chowder

Flesh from backbones and heads or other portions of fish may be utilized. The amounts in the formula given here are sufficient for one dozen No. 2 cans or pint jars.

5 lbs. diced potato,	2 qts. fish broth,
5 lbs. fish, boned, (edible portion)	2 Tblsp. salt,
3/4 lb. salt pork, fat back, diced,	$\frac{1}{2}$ Tsp. pepper.
3/4 lb. chopped onion,	

1. Dice the pork in quarter inch cubes, chop the onion quite finely, then dice the potato in half inch cubes.

2. Braise the diced pork in the bottom of a two gallon kettle until it is yellow in color. Then add the onions and cook them until they are soft and light yellow in color.

3. Add the potatoes, fish, and fish broth. Heat to boiling. Add the salt and pepper, stirring well.

4. Fill into containers and seal immediately while hot.

5. (a). Process (sterilize) pint jars 100 minutes at 10 pounds of pressure or (240° F.).

(b). Process (sterilize) No. 2 cans 90 minutes at 10 pounds of pressure or (240° F.).

6. (a). Tighten seals of pint jars after canning and air cool.

(b). Cool No. 2 cans as rapidly as possible after canning in cold or running water.

7. This is a condensed chowder. To prepare it for the meal, add 1 pint of milk and a tablespoon of cornstarch (if desired as a thickener), to the contents of a No. 2 can or pint jar and heat before serving.

Fishery Industries,
March 9, 1935,
NDJ/TWV - 3,000.

"Canning of Fishery Products" 1919

Cobb - Pub. by Miller Freeman, Seattle, Wash.
Copy in Libray Bur. of Fisheries Div. of Commerce
P. 92-98 - packing room